REMARKS

The claims in the application are 1-30 and Claims 31-34 added by the present amendment.

Favorable reconsideration of the application as amended is respectfully requested.

Claims 6-30 which have been withdrawn from consideration in paragraph 1 of the Office Action should be allowable upon allowance of a generic claim. In this regard, method Claim 21 has been amended to depend from Claim 1. Claims 31-34 are directed to recitation deleted from Claims 2 and 4. Claim 35 finds support at page 16, lines 5-10 of the specification, while the amendment to Claim 1 finds support at page 3, lines 1-18 and page 14, lines 19-31of the specification.

Accordingly, the only outstanding issue is the prior art rejection of the claims.

Claims 1-5 have been rejected under 35 U.S.C. §103 in paragraph 3 of the Office Action, as obvious over U.S. Pat. No. 4,790,465 to Fellows et al, described in the background portion of the present application and over which the present invention constitutes explicit improvement. More specifically, this reference teaches cleaving an optical fiber 2 with a blade 3 vibrating at frequencies from one kilohertz to one hundred kilohertz (column 1, lines 45-48). At higher frequencies approaching one hundred kilohertz (column 3, lines 1-10) a piezo-electric transducer is used to create oscillations of the blade 3. For example, in the embodiment illustrated in Fig. 7, vibrations of approximately seventy kilohertz of the blade 3 are induced by a piezo-electric transducer 51 (column 3, lines 43-48).

It is explicitly recommended in Fellows et al blade oscillation frequency be on the order of kilohertz to minimize blade 3 intrusion into the optical fiber 3 upon impact (column 3, lines 12-22). Although Fellows et al mention it is possible to use the same actuator to produce both superimposed main motion and oscillation (column 3, lines 1-3), this reference fails to disclose any such operational embodiment.

However, it has now been found, contrary to the teachings of Fellows et al, vibrating frequency of cleaving blade 27 can be substantially reduced compared to frequencies used in Fellows et al, i.e., well below one kilohertz, to attain previously-unrealized advantages in both improved cleaving and minimize costs of manufacture and operation (reference is being made to preferred embodiments of the present invention illustrated in the drawings of the present application). These advantages are explicitly attained by the invention recited in independent Claim 1 and which is directed to (among other features), apparatus for cleaving thin rods 3 such as optical fibers and having two clamping locations 21, 22 for the rod 3, a cleaving blade 27 carried by a body 28 and drive means 31, 33 acting on this body 28 to cause relatively steady movement of the blade 27 toward a cleaving point upon the rod 3 while, at the same time, subjecting the blade 27 to relatively small-amplitude, superimposed vibrations toward and away from the cleaving point.

More specifically, the drive means 31, 33 vibrate the body 28 and blade 27 with frequency below one kilohertz such that the blade 27 moves comparatively far toward the rod 3 in a time period between two subsequent oscillations at a given velocity of relatively steady movement, compared with vibration frequencies above one kilohertz. This ensures cleaving the rod 3 with minimal strokes and improved optical flatness.

With the claimed method, there is great probability of cutting the rod or fiber 3 with just a single stroke, thus avoiding need for additional cutting strokes by the blade 27 which could degrade end surfaces of the rod or fiber 3. Such relatively low vibratory frequencies are easier to create than higher frequencies and result in less problems with harmonics. In a preferred embodiment of the present invention where frequencies are limited below 750 Hz (Claim 2) and preferably to the range between 100 and 700 Hz (Claim 31) , unwanted resonance effects in the vibrating body are avoided (page 3, line 33-page 4, line 2).

As pointed out *supra*, the present invention is directly contrary to the teachings found in Fellows et al which indicate successful operation cannot be attained at frequencies below one kilohertz. Accordingly, it has been surprisingly discovered much lower frequencies actually improve cleaving over what was previously thought. Fellows et al do not explicitly show using the same actuator for generating both superimposed main motion and oscillation because this reference fails to even recognize oscillating frequencies had to be substantially lowered as compared to the taught operational frequency range from one kilohertz to one hundred kilohertz to achieve such result (page 3, lines 20-28).

Accordingly, as established herein, the allegedly "small" change in operating frequency is clearly not within the level of skill in the art, since Fellows et al explicitly teach away from even considering such a change. Therefore, Fellows et al fail to render obvious the invention recited in any pending claim herein.

The remaining art of record has not been applied against the claims and will not be commented upon further at this time.

Accordingly, in view of the forgoing amendment and accompanying remarks, it is respectfully submitted all claims pending herein are in condition for allowance. Please contact the undersigned attorney should there be any questions. A petition for an automatic two month extension of time for response under 37 C.F.R. §1.136(a) is enclosed in triplicate, together with the requisite petition fee and fee for additional claims introduced herein.

Early favorable action is earnestly solicited.

Respectfully submitted,

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